

FY05 Forest Service Aviation Accident Review

In Memory of:

Charles Edgar

John Greeno

José Gonzales

Introduction

Information Sharing

- NTSB regulation 831.13 Flow and dissemination of accident or incident information generally states that “Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action. However, no information concerning the accident or incident may be released to any person not a party representative to the investigation (including non-party representative employees of the party organization) before initial release by the Safety Board without prior consultation and approval of the IIC.

Introduction

The NTSB has not finalized all or determined probable cause for all of the accidents at this time.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed

For accident prevention purposes only

NTSB Identification: **DFW05FA086**

Accident occurred March 10, 2005 in Shelbyville, TX

Aircraft: Bell 206 BIII

Fatalities: 3

Operational Control Region 8, Sabine NF



Mission

The aircraft was performing aerial ignition operations using a cabin-mounted plastic sphere dispenser (PSD) machine in support of a prescribed burn on the Sabine National Forest in Eastern Texas.

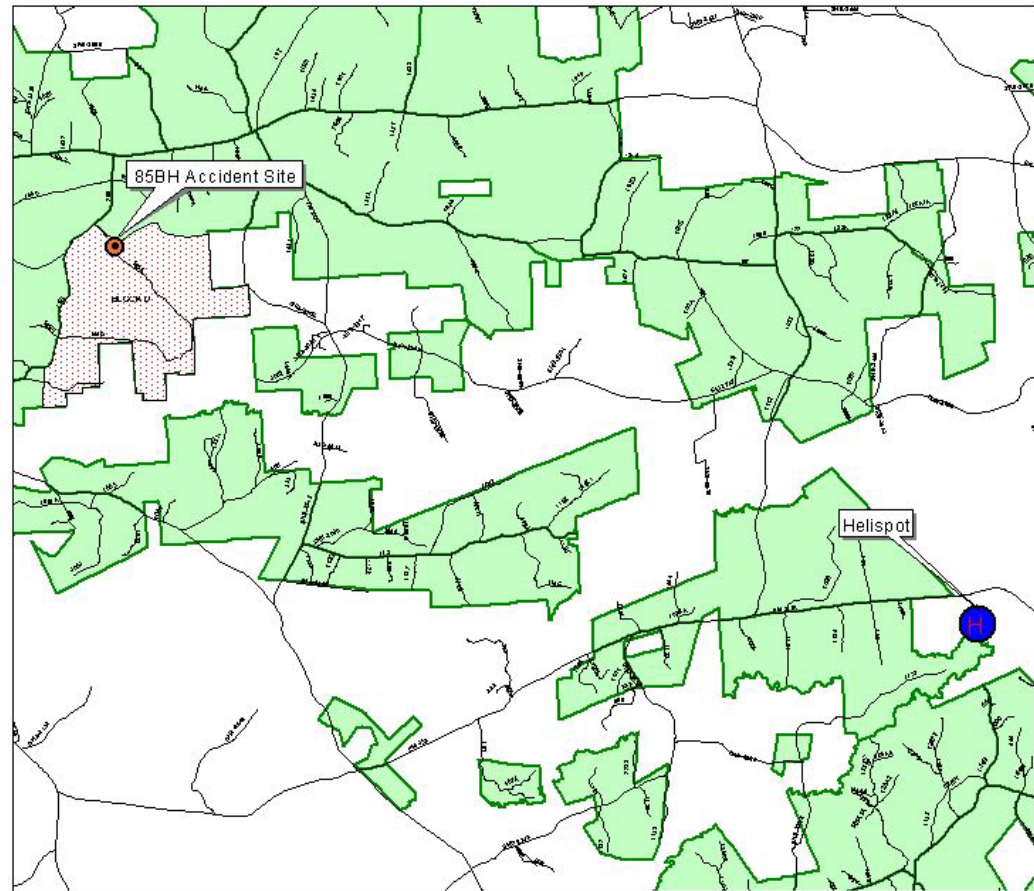
On the morning of the accident, the helicopter was assigned to support a prescribed fire within heavily wooded terrain with 50-60 foot high trees near Shelbyville, TX. The prescribed fire was supported by the application of a PSD machine. PSD missions are typically flown at 50-150 feet above the top of vegetation at airspeeds from 20-40 knots.



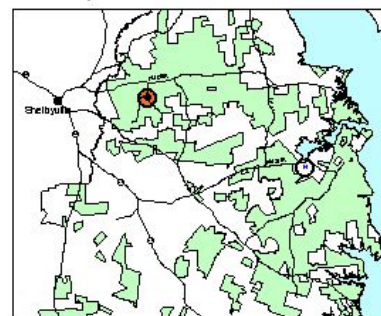
PSD Machine at accident site

The helicopter was pre-positioned and a mission brief was conducted at Angelina County Airport, Lufkin, Texas. At 0900, after the mission brief, the helicopter and re-fueling truck re-positioned to H1 and were met by support equipment and personnel from the Sabine National Forest to conduct the prescribed fire mission.

N85BH ACCIDENT
Helispot 1 Vicinity Map



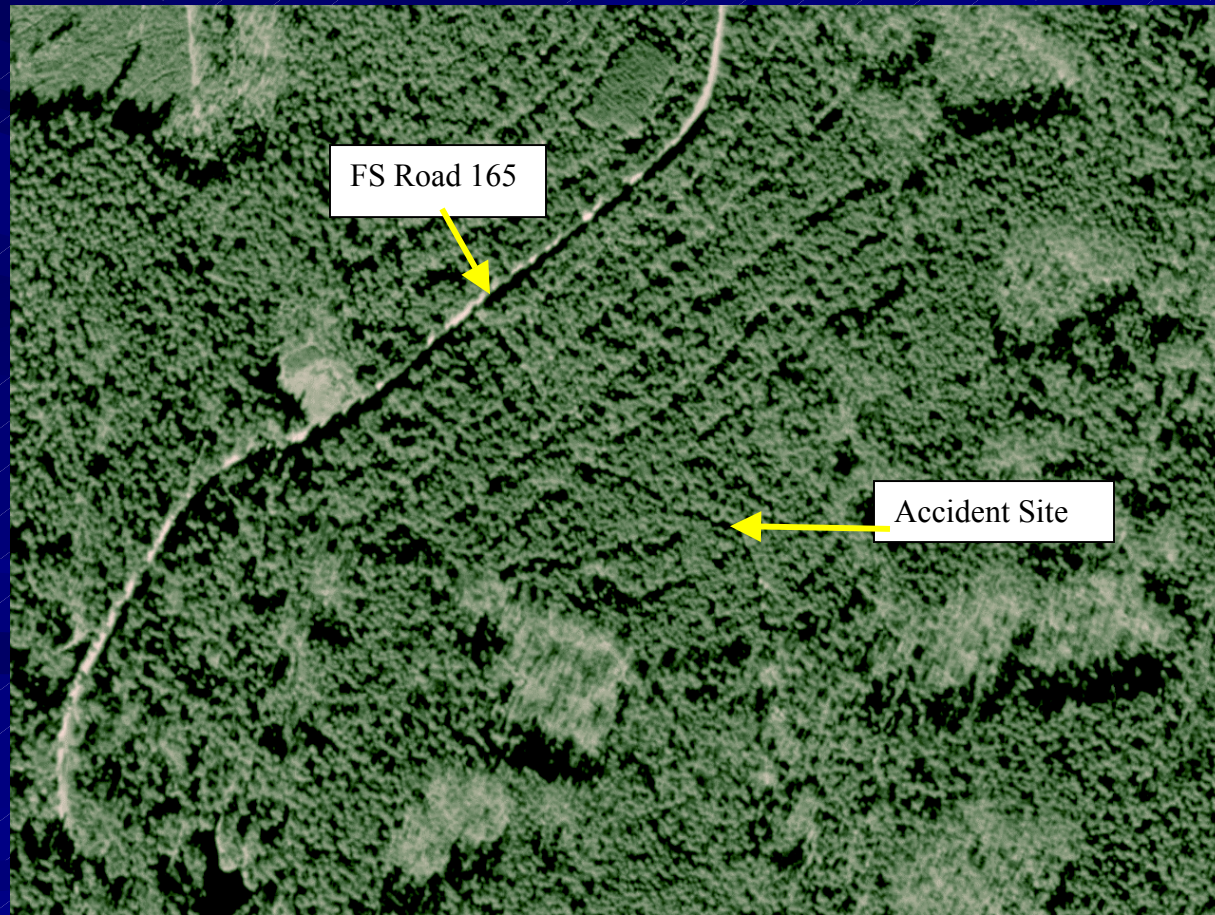
Vicinity



5000 0 5000 10000 15000 Feet



After 45 minutes of aerial ignition work, the PSD machine experienced a sphere jam, and the helicopter returned to H1 to resolve the problem. The helicopter shut down at H1 while the PSD machine problem was resolved.



The helicopter then departed H1 at 1347 to resume the mission. According to dispatch records, at 1352, the mission ignition specialist onboard the aircraft reported by radio that the helicopter was commencing firing operations



Prominent damage on only a few trees indicates steep vertical descent, two trees shown here.

This tree was cut down in order to better observe the blade strike/scarring

At 1354, a radio distress call was heard on the assigned Forest Service tactical frequency by ground personnel. According to USFS personnel, the voice making the distress call appeared to be that of the ignition specialist, not the pilot. The call was, "Mayday, Mayday, Mayday, we are going down." No further communications were heard from the helicopter.



Front view of aircraft looking to the northwest

At 1417, the helicopter wreckage was found. Immediate rescue operations commenced.



Rotor blade in foreground and tail boom were located in front of the helicopter prior to rescue efforts. Note position of tail rotor assembly (yellow arrow)

NTSB has not released a probable cause at this time.



Close up of severe impact in right forward cabin area

Accident Review Board (ARB) Action Items

- **Recommendation 1:** Include in FS agency policy, relative to pilot approval (carding), a requirement that agency pilot inspectors review/verify pilot time for those pilots that have never been approved by the agency (Initial approvals). Subsequent approvals would not require this review for total time.
- A. Modify all Forest Service aircraft contracts to require contractors, submitting pilots for initial approval, provide verification of pilot flight time through employment history to include contact information in a standardized format.
- B. Review contract language to ensure appropriate remedies where pilot qualifications are incorrectly reported.
- C. Modify FSM 5700 and FSH 5709.16 to require pilot inspectors to verify pilot time for all initial pilot cards, utilizing verification records provided by contractor.
- D. Ensure all pilot inspectors are briefed regarding the changes at annual pilot inspector workshops.
- E. Make recommendation to DOI, Aviation Mgmt Directorate regarding above changes to incorporate into OPM 21.

ARB Action Items continued

- **Recommendation 2:** Recommend to Interagency committee to include a requirement in the Interagency Aerial Ignition Guide pre-mission briefing that addresses PSD flight profile “watch out” situations including but not limited to loss of tail rotor effectiveness (LTE), Settling with Power, etc.
- **Recommendation 3:** Require pilots being evaluated for an Initial pilot approval (carding) demonstrate to the Inspector Pilot their skill in low level, low airspeed maneuvering in a PSD flight profile during flight evaluation.
 - A. Modify Interagency Helicopter Practical Test Standards document to incorporate requirement.
 - B. Ensure all pilot inspectors are briefed regarding the changes at annual pilot inspector workshops.

NTSB Identification: **DEN05TA113**

Accident occurred July 19, 2005 in Loveland, CO

Aircraft: Hughes 369FF, registration: N530TJ

Injuries: 1

Minor.Operational Control: Arapaho-Roosevelt NF



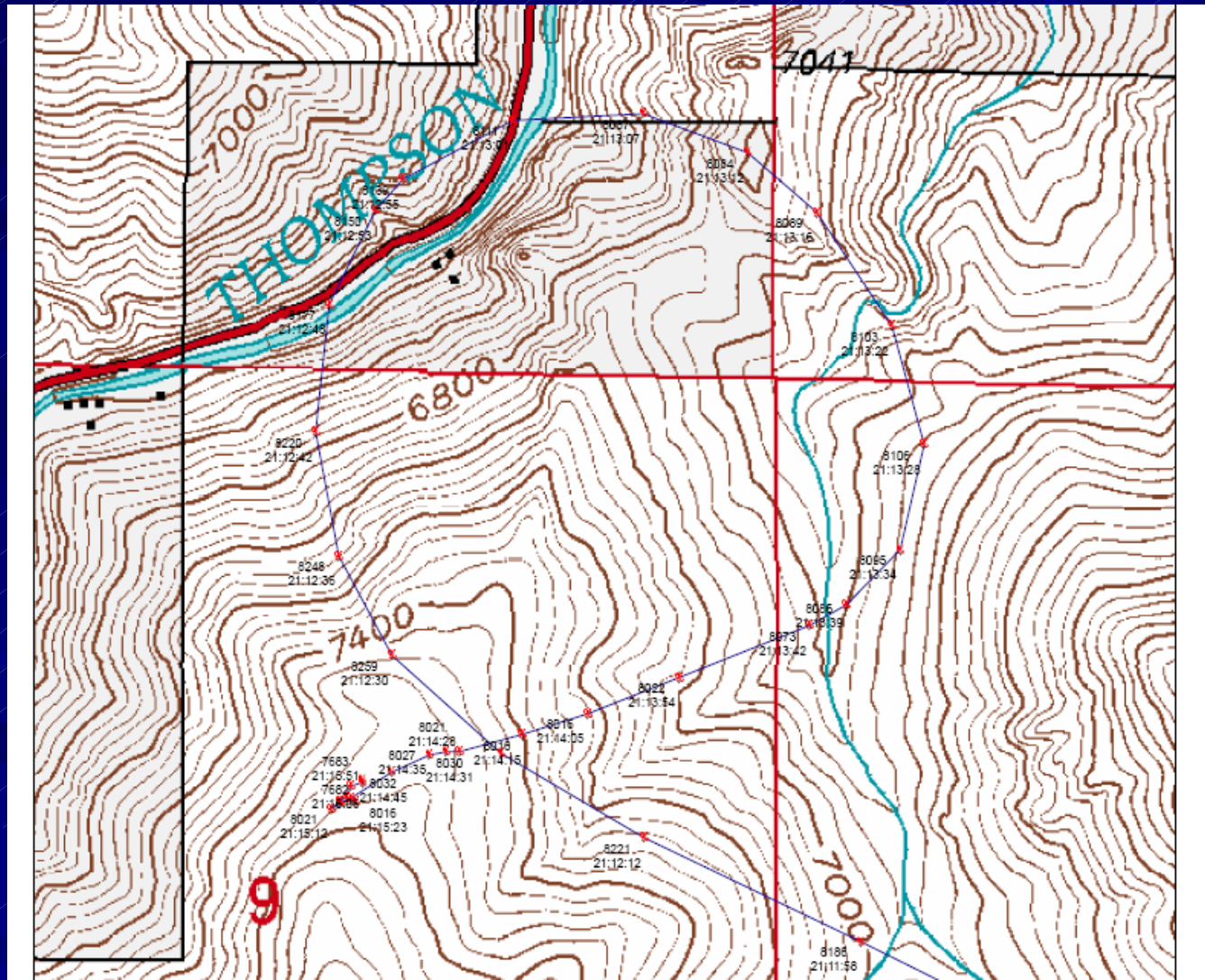
Mission

The helicopter was being used to support firefighting operations in the area and was delivering supplies via external load. The helicopter was equipped with a 100-foot long line and a 12-foot leadline. The cargo consisted of bladder bags and hose with a total weight of 732 pounds.

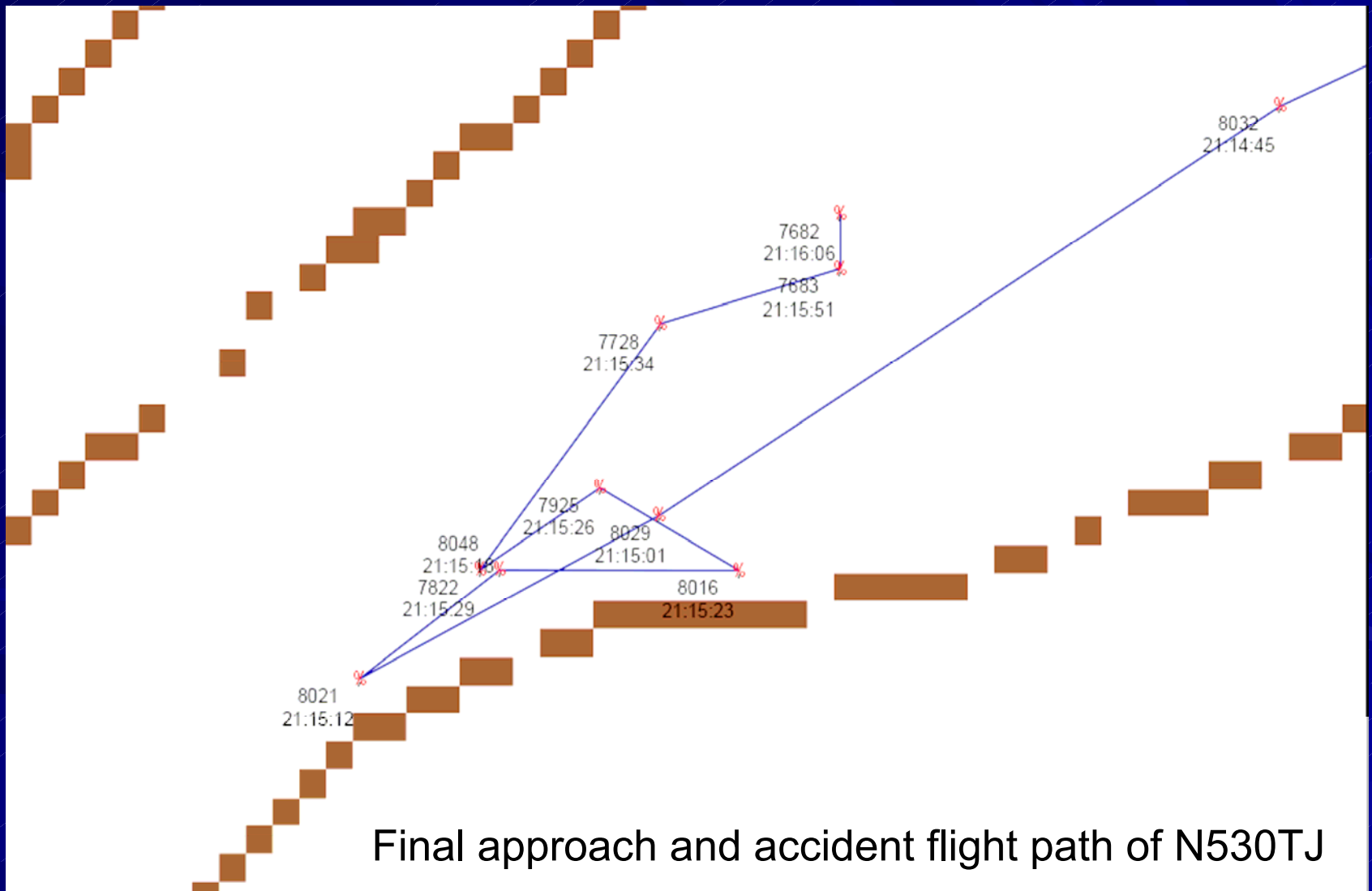
While on approach to the established drop site, approximately 100 yards away, the helicopter experienced an uncommanded yaw to the right. The pilot was unable to regain control and after several rotations crashed.



After the helicopter completed one 360-degree rotation to the right, the pilot released the external load, and lowered the collective in an attempt to arrest the right rotation.



When the helicopter began to descend toward the trees, the pilot "pulled pitch." The helicopter continued to rotate to the right, between 5 and 7 rotations.



Subsequently, the helicopter impacted terrain and came to rest on its left side. Prior to or during the uncommanded right yaw, the pilot did not observe any visual warnings or hear any aural warnings in the helicopter.



Witnesses who observed the accident stated they did not see any components separate from the helicopter prior to impact with trees and terrain. Initial analysis from McDonnell Douglas shows no mechanical failures with the aircraft.



In a review of the performance planning, the pilot failed to properly complete the load calculation and the helicopter manager failed to review for accuracy.

INTERAGENCY HELICOPTER LOAD CALCULATION OAS-67/FS 5700-17 (11/03)		MODEL <u>530F</u>
PILOT(S)		N# <u>530TJ</u>
MISSION		DATE <u>7/19</u>
		TIME
1 DEPARTURE	PA <u>9500</u> OAT <u>38</u>	
2 DESTINATION	PA OAT	
3 HELICOPTER EQUIPPED WEIGHT	<u>1860</u>	
4 FLIGHT CREW WEIGHT	<u>200</u>	
5 FUEL WT (<u>42</u> gallons X <u>7</u> lbs per gal)	<u>300</u>	
6 OPERATING WEIGHT (3 + 4 + 5)	<u>2454</u>	
	Non-Jettisonable	Jettisonable
	HIGE	HOGE HOGE-J
7a PERFORMANCE REF (List page/chart from FM)	<u>3100</u>	<u>3100</u> <u>3750</u>
7b COMP GROSS WT (FM Performance Section)	<u>3100</u>	<u>3100</u> <u>3100</u>
8 WT REDUCTION (Req for all Non-Jettisonable)	<u>1200</u>	<u>120</u> <u>@</u>
9 ADJUSTED WEIGHT (7b minus 8)	<u>2980</u>	<u>2980</u> <u>3100</u>
10 GROSS WT LIMIT (FM Limitations Section)	<u>3100</u>	<u>3100</u> <u>3100</u>
11 SELECTED WEIGHT (Lowest of 9 or 10)	<u>2980</u>	<u>2980</u> <u>3100</u>
12 OPERATING WEIGHT (From Line 6)	<u>2454</u>	<u>2454</u> <u>2454</u>
13 ALLOWABLE PAYLOAD (11 minus 12)	<u>526</u>	<u>526</u> <u>646</u>
14 PASSENGERS/CARGO MANIFEST		

INTERAGENCY HELICOPTER LOAD CALCULATION 2A OAS-67/FS 5700-17 (11/03)		MODEL <u>530F</u>
PILOT(S)		N# <u>53TJ</u>
MISSION		DATE <u>7/19 (05)</u>
		TIME
1 DEPARTURE	* PA <u>9300</u> OAT <u>35</u>	* <input checked="" type="checkbox"/>
2 DESTINATION	* PA OAT	<input type="checkbox"/>
3 HELICOPTER EQUIPPED WEIGHT	<u>1785.5 + 200 (CREW) = 1985.5</u>	* <input checked="" type="checkbox"/>
4 FLIGHT CREW WEIGHT	<u>200</u>	
5 FUEL WT (<u>42</u> gallons X <u>7</u> lbs per gal)	<u>300 (294)</u>	
6 OPERATING WEIGHT (3 + 4 + 5)	<u>2306</u> *	
	Non-Jettisonable	Jettisonable
	HIGE	HOGE HOGE-J
7a PERFORMANCE REF (List page/chart from FM)	* CSP-FF-1 Rev 4 pg 5-12	* CSP-FF-1 Rev 5 pg 8-4
7b COMP GROSS WT (FM Performance Section)	<u>CANNOT COMPUTE</u>	<u>VALID</u>
8 WT REDUCTION (Req for all Non-Jettisonable)	<u>VALUES AS THESE TEMPS</u>	
9 ADJUSTED WEIGHT (7b minus 8)	<u>Alt ARE OFF CHART</u>	
10 GROSS WT LIMIT (FM Limitations Section)	<u>AND CONFIRMED BT</u>	
11 SELECTED WEIGHT (Lowest of 9 or 10)	<u>McDonnell-Douglas</u>	
12 OPERATING WEIGHT (From Line 6)	<u>REPS</u>	<u>7/25/05</u>
13 ALLOWABLE PAYLOAD (11 minus 12)		
14 PASSENGERS/CARGO MANIFEST		

This is a corrected version that the investigation team computed for the actual conditions.

INTERAGENCY HELICOPTER LOAD CALCULATION 3 OAS-67/FS 5700-17 (11/03)		MODEL 530F	
PILOT(S)		N# 530TJ	
MISSION (ACCIDENT REVIEW)		DATE 7/19/05	
		TIME	
1 DEPARTURE	PA	OAT	<input type="checkbox"/>
2 DESTINATION	PA 8,000	OAT 32°	<input type="checkbox"/>
3 HELICOPTER EQUIPPED WEIGHT	1,806		
4 FLIGHT CREW WEIGHT	200		
5 FUEL WT (_____ gallons X _____ lbs per gal)	280		
6 OPERATING WEIGHT (3 + 4 + 5)	2,286		
	Non-Jettisonable		Jettisonable
	HIGE	HOGE	HOGE-J
7a PERFORMANCE REF (List page/chart from FM)	CSP-FF-1 REV 4 Pg 5-12	CSP-FF-1 REV 5 Pg 8-4	CSP-FF-1 REV 5 Pg 8-4
7b COMP GROSS WT (FM Performance Section)	3,180	2,945	2,945
8 WT REDUCTION (Req for all Non-Jettisonable)	120	120	Ø
9 ADJUSTED WEIGHT (7b minus 8)	3,060	2,825	2,945
10 GROSS WT LIMIT (FM Limitations Section)	3,100	3,100	3,750
11 SELECTED WEIGHT (Lowest of 9 or 10)	3,060	2,825	2,945
12 OPERATING WEIGHT (From Line 6)	2,286	2,286	2,286
13 ALLOWABLE PAYLOAD (11 minus 12)	774	539	659

14 PASSENGERS/CARGO MANIFEST

* ACTUAL CONDITIONS *

ACTUAL PAYLOAD 732

NTSB probable cause

The pilot's failure to maintain aircraft control due to delayed remedial action during the encounter with the loss of tail rotor effectiveness.

Contributing factors were the pilot's inadequate preflight performance planning, and the inadequate supervision by the US Forest Service personnel.



Accident Review Board (ARB) Action Items

- **RECOMMENDATION 1:** Standardize requirements for pilot inspections, training, longline experience, and overall proficiency to meet Interagency standards when carded for interagency fire use. Such standards should include:
 - Require a minimum of two hours of annual longline training certified by the chief pilot of the company and verified by a representative of the agency conducting the carding process.
 - Flight hours in type of aircraft may only be reduced by 50% if pilots attend a manufacturer approved factory school.
 - Require pilots via contract, to keep track of their longline experience.
- **RECOMMENDATION 2:** Develop and implement training for helicopter crew members under standardized call-when-needed (CWN) and exclusive use contract language requirements.

ARB Action Items continued

- **RECOMMENDATION 3:** The Forest Service and AMD need to reinforce to the Helicopter Inspector Pilots the need to conduct quality inspections by following all current pilot inspection procedures especially during the certification of new pilots who will be operating under CWN contracts.
- **RECOMMENDATION 4:** Develop a national policy and procedures for Interagency Dispatch Centers to record and retain radio communication transmissions generated during incidents and accidents.

NTSB Identification: **LAX05GA243**

Accident occurred July 21, 2005 in Las Vegas, NV

Aircraft: Aero Commander 680 FL, registration: N7UP

Injuries: 2 Serious, 1 Minor.

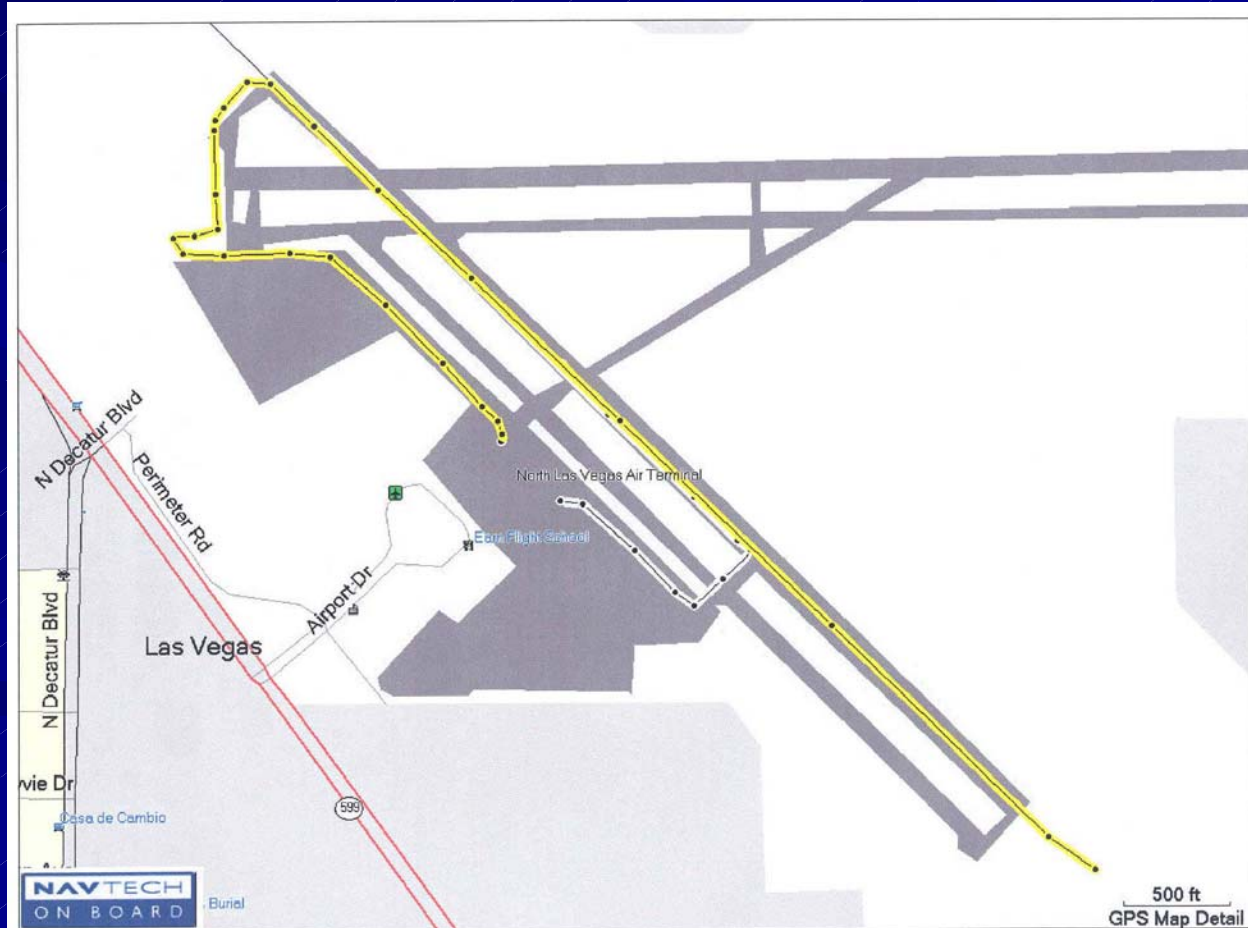
Operational Control: R-4 Humboldt-Toiyabe NF



Mission

The aircraft was en route to fly a fire-detection reconnaissance due to lightning storms that had recently passed through the Spring Mountains National Recreation Area.

During takeoff from runway 12R witnesses reported seeing the airplane airborne but not climbing. The airplane continued down the runway in a nose up attitude and remained in ground effect until impacting terrain about 600 feet southeast from the departure end of runway 12R. The aircraft impacted in a 30-degree nose down attitude.



During the accident sequence the airplane rotated about 270 degrees around the vertical axis. The cockpit section of the airplane was destroyed during the accident sequence.



The flaps were measured to be at the 30-degree position. The flap actuator was measured and also corresponded to a 30-degree position. The flap indicator was damaged in the impact sequence but indicated the flaps were in the 30-degree position.



The airplane was destroyed and the pilot and one passenger sustained serious injuries; the second passenger sustained minor injuries. There was not crash and rescue on-site at North Las Vegas airport



The local fire reconnaissance flight departed North Las Vegas at 1707. Visual meteorological conditions prevailed. The temperature was 107.1 degrees fahrenheit. The flight manual performance chart maximum is 100 degrees.

Weather Conditions for KVG T

Current time: July 21, 2005 - 18:37 PDT

Most Recent Observations at July 21, 2005 - 17:50 PDT

	17:50	Max since Midnight	Min since Midnight	24 Hour Max	24 Hour Min
Temperature	107.1° F	107.1 at 16:50	88.0 at 5:50	107.1 at 18:50	88.0 at 5:50
Dew Point	48.9° F	55.9 at 13:50	48.2 at 17:20	55.9 at 13:50	48.2 at 17:20
Relative Humidity	15%	32 at 6:50	15 at 16:50	32 at 6:50	15 at 16:50
Wind Speed	3 mph from NNW	8 at 3:50	0 at 6:50	17 at 20:50	0 at 6:50
Wind Gust	-	-	-	29 at 20:50	29 at 20:50
Pressure	27.48 in	27.62 at 7:50	27.47 at 17:20	27.62 at 7:50	27.47 at 17:20
Sea level pressure	29.65 in	29.80 at 8:50	29.65 at 17:50	29.80 at 8:50	29.65 at 17:50
Altimeter	29.78 in	29.93 at 7:50	29.77 at 17:20	29.93 at 7:50	29.77 at 17:20
Weather conditions	clear	-	-	-	-
Visibility	10.00 miles	10.00 at 0:50	10.00 at 0:50	10.00 at 18:50	10.00 at 18:50

The flight manual performance chart that was being utilized for this aircraft was for an STC with an additional 500 pounds, when in fact the aircraft had never actually had the STC conversion.

Jul 24 05 03:26p Richard P. MacCaon 3603875188
SUITE 321 - HATHAWAY BUILDING
7120 HAYVENHURST
VAN NUYS, CALIFORNIA 91406

p.1

680 PL(P) FLIGHT MANUAL SUPPLEMENT
POWERPLANT CONVERSION STC NO. SA2801WE
G.W. = 8500 LBS.

84 INCH DIAMETER PROPELLER
SINGLE ENGINE RATE OF CLIMB IN FEET PER MINUTE

Use maximum continuous power on the operating engine (29.5 in. Hg. MAP, 2650 RPM). Landing gear up and flaps up, inoperative engine feathered. Climb at best rate of climb speed.

SINGLE ENGINE CLEAN CLIMB

Gross Weight Pounds	Best Climb Speed MPH(CAS)	Pressure Altitude Feet	OUTSIDE AIR TEMPERATURE - °F					
			-25	0	25	50	75	100
8500	116	sea level	355	306	250	216	174	135
	115	2000	331	281	235	190	148	108
	115	4000	297	247	200	156	113	73
	114	6000	250	209	163	117	71	33
	114	8000	222	171	123	78	35	-5

NORMAL RATE OF CLIMB IN FEET PER MINUTE

Use maximum continuous power on both engines (29.5 in. Hg. MAP, 2650 RPM). Landing gear up, flaps 10° (1/4). Climb at best rate of climb speed.

NORMAL CLIMB

Gross Weight Pounds	Best Climb Speed MPH(CAS)	Pressure Altitude Feet	OUTSIDE AIR TEMPERATURE - °F					
			-25	0	25	50	75	100
8500	132	sea level	1480	1406	1330	1272	1211	1153
	131	2000	1443	1369	1300	1235	1174	1116
	129	4000	1392	1318	1248	1183	1122	1065
	127	6000	1329	1255	1186	1121	1060	1003
	128	8000	1271	1197	1129	1061	1003	945

FAA APPROVED: June 5, 1974

REVISED NOV 5 1975

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Jul 24 05 03:33p Richard P. MacCaon 3603875188
SUITE 321 - HATHAWAY BUILDING
7120 HAYVENHURST
VAN NUYS, CALIFORNIA 91406

p.2

680 PL FLIGHT MANUAL SUPPLEMENT
POWERPLANT CONVERSION STC NO. SA2801WE
G.W. = 8000 LBS.

80 INCH DIAMETER PROPELLER
BALKED LANDING RATE OF CLIMB IN FEET PER MINUTE

Use maximum continuous power on both engines (29.5 in. Hg. MAP, 2650 RPM). Gear down and flaps full down. Climb at best rate of climb speed.

TWIN ENGINE BALKED LANDING CLIMB

Gross Weight Pounds	Best Climb Speed MPH(CAS)	Pressure Altitude Feet	OUTSIDE AIR TEMPERATURE - °F					
			-25	0	25	50	75	100
8000	116	sea level	915	843	775	711	651	594
	114	1000	891	819	751	687	627	570
	112	2000	872	799	731	667	606	549
	110	3000	852	779	710	646	585	527
	109	4000	831	758	689	625	564	506
	106	5000	810	737	668	603	542	483
	105	6000	789	716	646	581	519	461
	102	7000	767	692	621	558	496	438
	100	8000	745	671	602	536	474	416

TAKE-OFF DISTANCES FEET

(Over a 50 Foot Obstacle)

Use maximum continuous power on both engines (29.5 in. Hg. MAP, 2650 RPM). Flaps set a 1/4 (10°). Attain full engine power before releasing brakes. Climb out at 112 MPH (97 knots) CAS.

TAKE-OFF GROSS WEIGHT 8000 LBS.

Pressure Altitude Feet	Wind Velocity MPH	OUTSIDE AIR TEMPERATURE - °F					
		-25	0	25	50	75	100
sea level	0	1600	1825	2069	2325	2590	2864
2000		1847	2105	2377	2660	2952	3253
4000		2121	2421	2723	3032	3352	3685
6000		2456	2774	3111	3460	3811	4162
8000	0	2806	3174	3549	3920	4289	4668

FAA APPROVED: May 29, 1974

REVISED NOV 5 1975

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NTSB has not released a probable cause at this time.



There were no action items from the Accident Review Board (ARB).

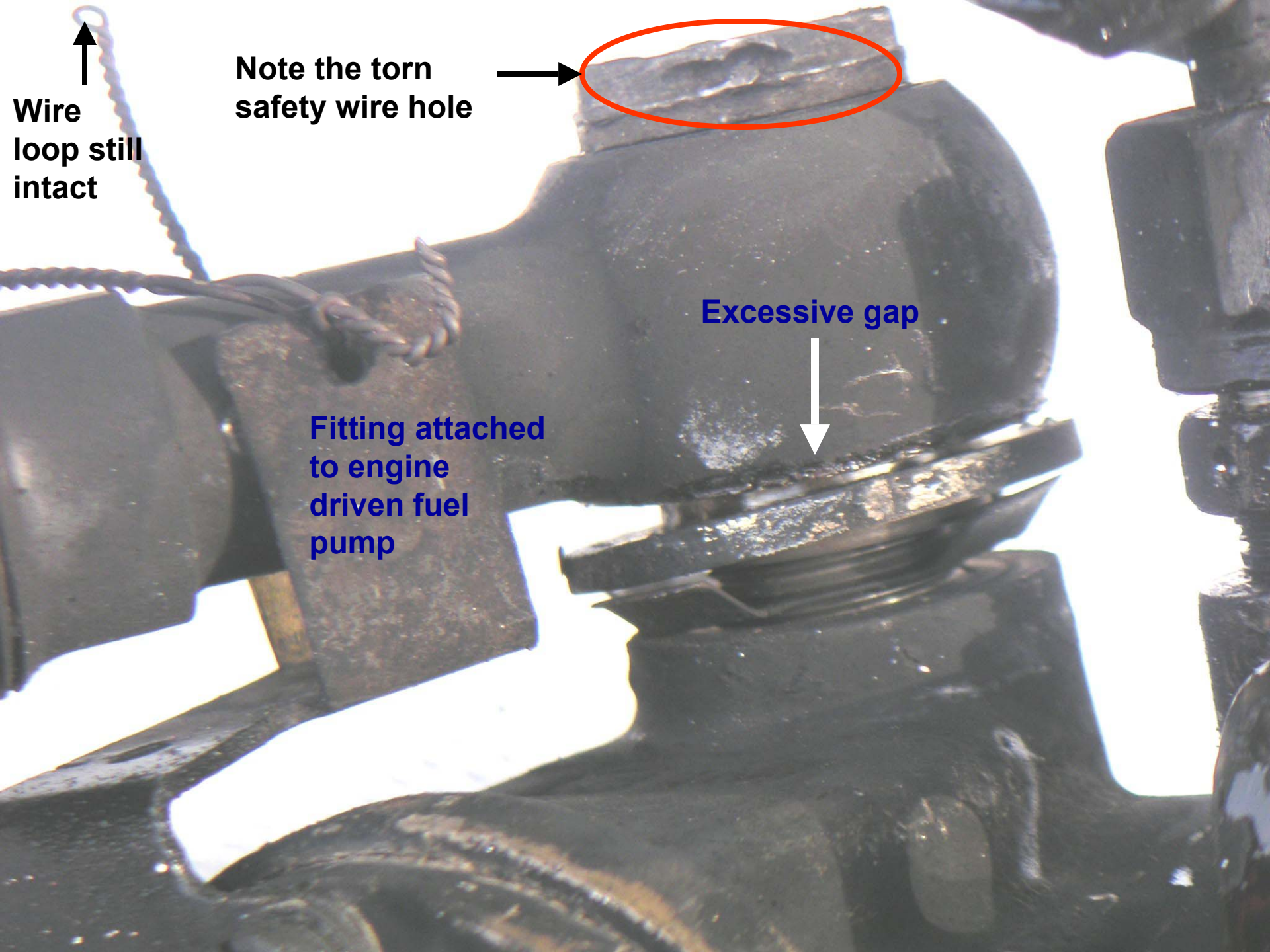
- **The ARB submitted a letter to the USFS Designated Agency Safety and Health Official (DASHO), National Aviation Safety and Training Manager (NASTM) and the Director, Fire and Aviation on a couple of issues that did not directly relate to the causal factor of this accident.**
 - **Follow-up on a study on fixed-wing performance charts that was started by the National Fixed-Wing Specialist.**
 - **Review the recommendation in the Interagency Standards for Fire and Fire Aviation Operations (Red Book) for Personnel Protective Equipment (PPE) for special mission use.**
- **The Accident Investigation Team recommended that the Federal Agencies that utilize the North Las Vegas airport meet with airport officials and be actively involved in the development of a new/updated emergency response plan and considerations when staging aircraft at the airport.**

FY 2005

Incidents With Potential

7/8/05 Dromander M-18 R-2 Pike/San Isabel NF Engine Fire





Wire
loop still
intact

Note the torn
safety wire hole

Excessive gap

Fitting attached
to engine
driven fuel
pump

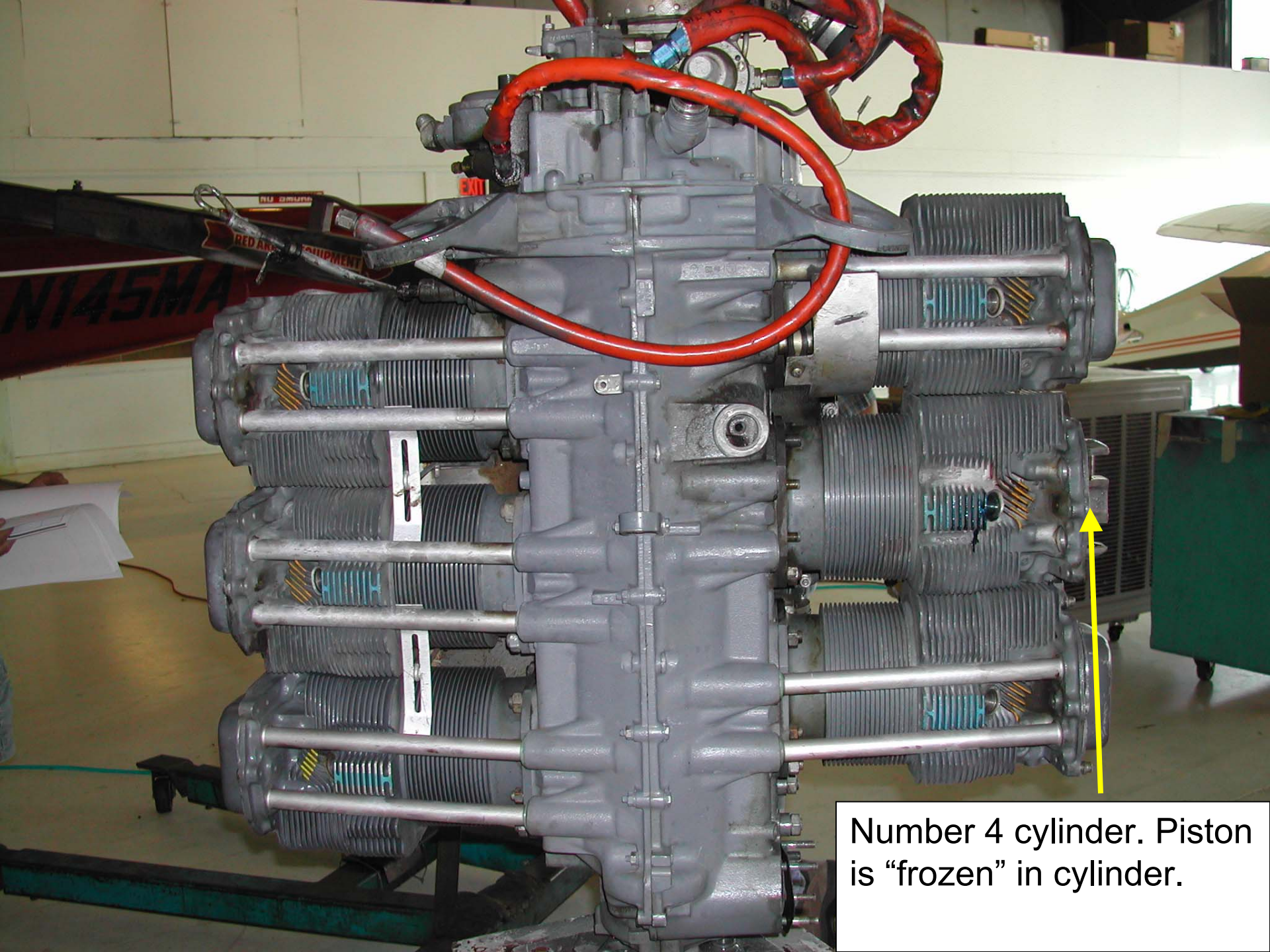
7/29/05 Ayres Thrush R-6 Malheur NF Engine Failure





8/5/05 Cessna 182 R-1 Helena NF Engine Failure/Power off Landing





Number 4 cylinder. Piston is "frozen" in cylinder.

8/27/05 Dromander M-18T
Washington State

R-6 Umatilla NF Contract
Prop damage on landing



